

PLACE WATER METER PITS A MINIMUM OF 15' APART
TO PREVENT CROSS TALK BETWEEN METERS.

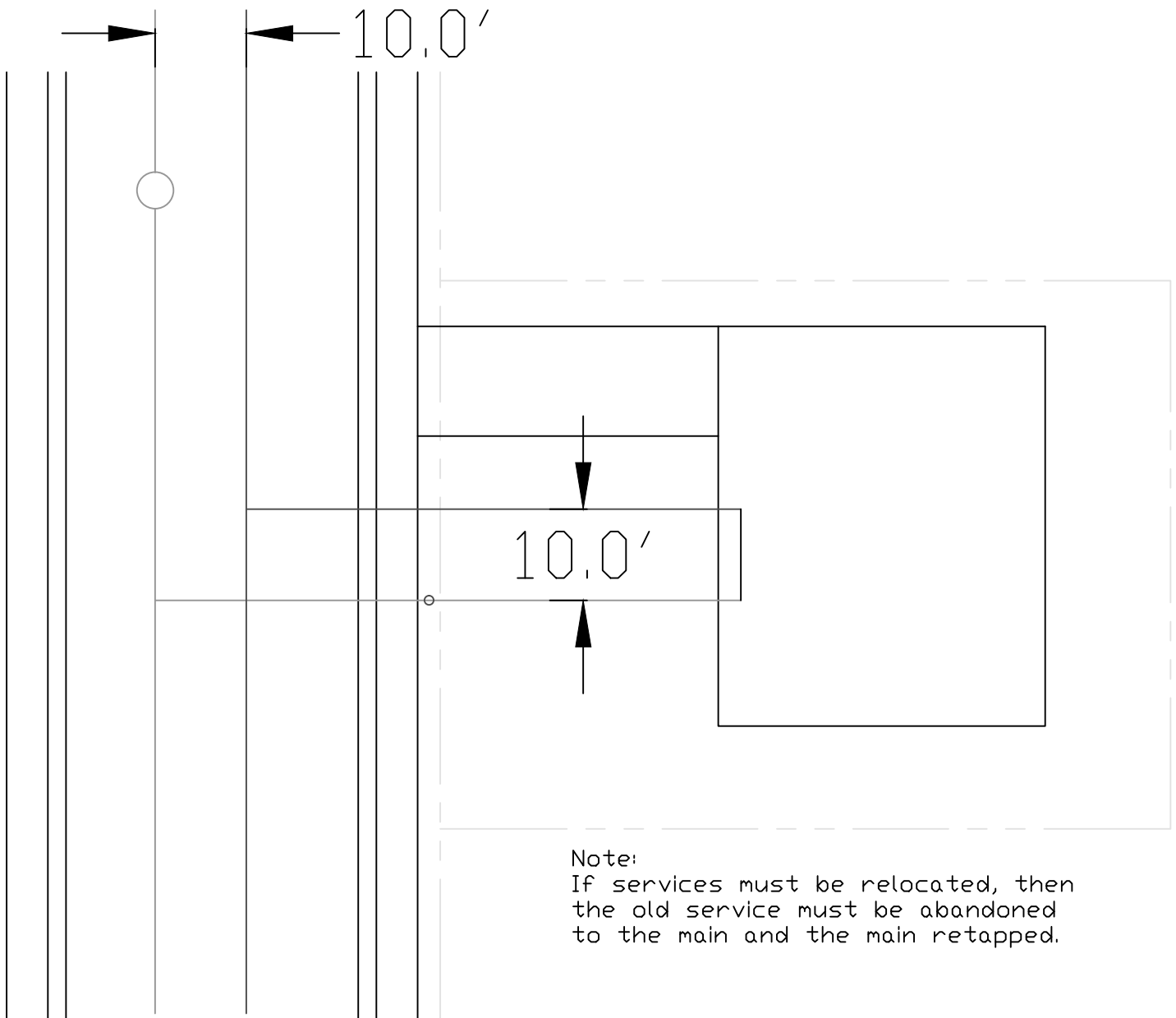


Brighton™

CUL-DE-SAC
SERVICES

DATE 5/1/2016
REVISED BY CWB

DRAWING
NUMBER
600-1



Service locations may vary to meet various house configurations.


Water service shall be placed on the downhill side of sanitary sewer service and with 10' min. separation.

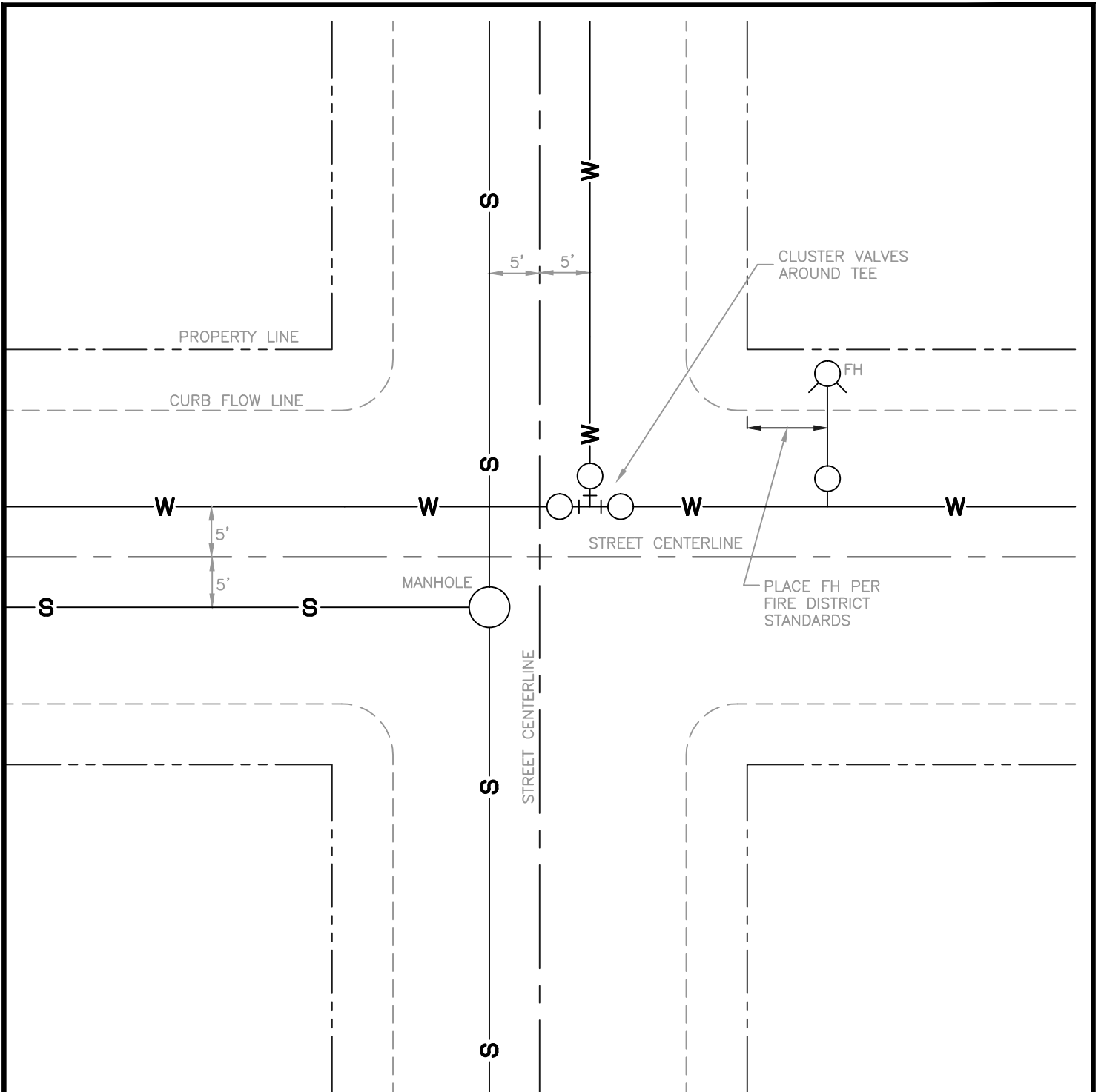
No more than two 1/8 bends (90° total) shall be permitted in any sanitary sewer service.

There shall be at least 10' separation between water meter pits.

Services shall enter lots at a perpendicular angle from the mains except in cul-de-sacs.

Place "V" on the curb face to mark water service locations and place a "X" on the curb face to mark sanitary sewer service locations.

 Brighton™	DATE 5/1/2016 REVISED BY CWB
TYPICAL HOUSE SERVICE	DRAWING NUMBER 600-2



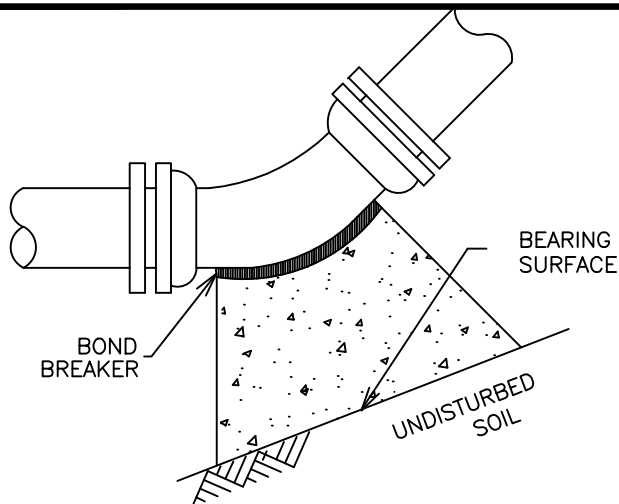
WATER AND SANITARY SEWER MUST BE SEPERATED
BY 10' MINIMUM DISTANCE.



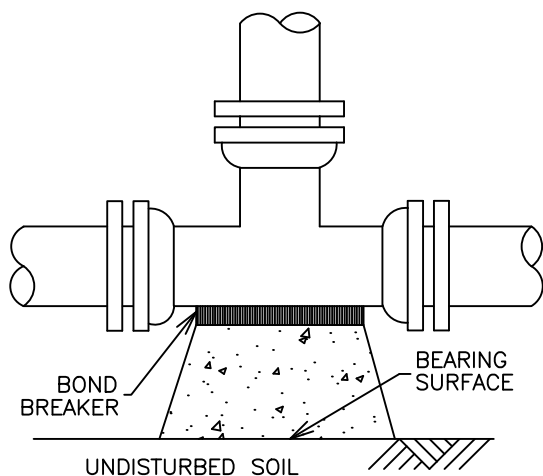
RESIDENTIAL UTILITY
LOCATION

DATE 5/1/2016
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DRAWING
NUMBER
600-3



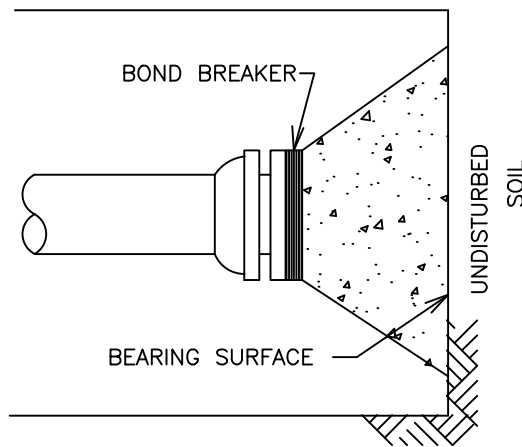
11 $\frac{1}{4}$ °, 22 $\frac{1}{2}$ °, 45° AND 90° BENDS



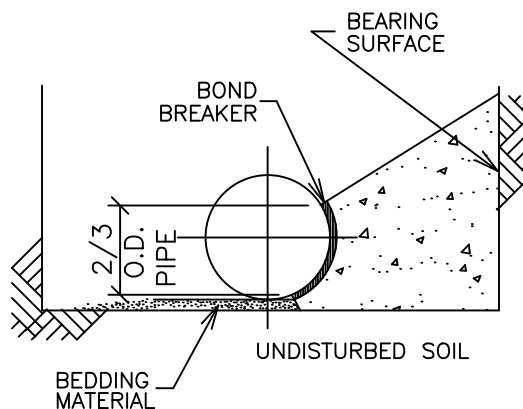
TEE

NOTES:

- 1.) BEARING SURFACES SHOWN IN CHART ARE MINIMUM.
- 2.) BASED ON 150 PSI INTERNAL PIPE PRESSURE PLUS WATER HAMMER.
4", 6", 8" AND 12" WATER HAMMER = 110 P.S.I.
16", 20" AND 24" WATER HAMMER = 70 P.S.I.
- 3.) SEE SECTION 6.42 AND SECTIONS 8.19 OF THE ENGINEERING STANDARDS.
- 4.) BASED ON 3,000 psf SOIL BEARING CAPACITY.
- 5.) NA = NOT APPLICABLE.



DEAD END



TYPICAL CROSS SECTION

MINIMUM BEARING SURFACE AREA (IN SQUARE FEET)

SIZE OF PIPE	BENDS			TEES & DEAD ENDS
	22 $\frac{1}{2}$ °	45°	90°	
6"	2.0	2.0	3.6	2.5
8"	2.0	3.4	6.2	4.4
10"	2.8	5.5	10.2	7.2
12"	4.0	7.9	14.5	10.3
14"	5.4	10.7	19.6	13.9
16"	7.0	13.8	25.4	18.0



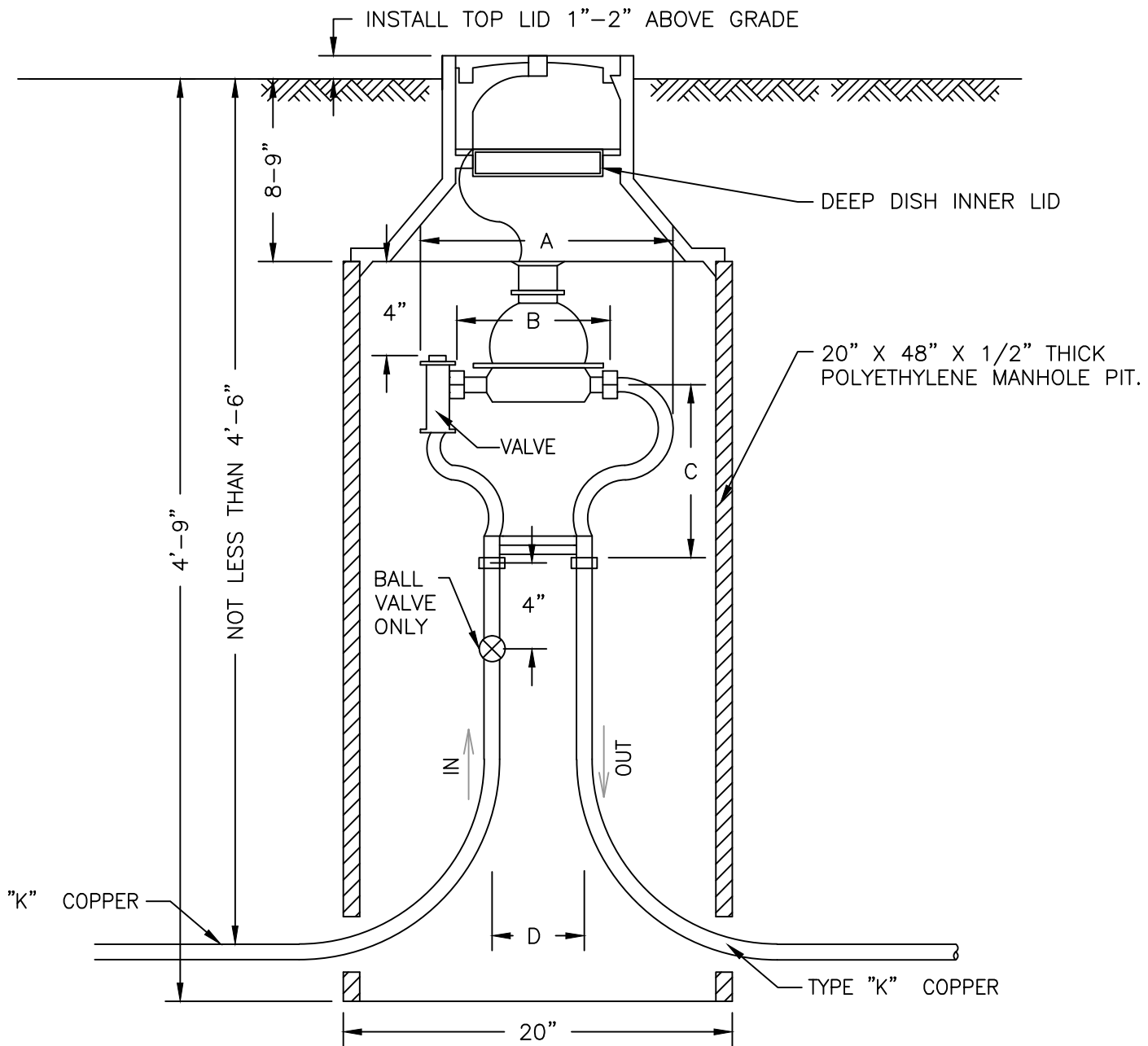
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THRUST BLOCK

DATE 5/1/2016
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DRAWING
NUMBER

600-4



PLACE METERS WITH A
MINIMUM SEPARATION OF 10'

MASONRY BASE FOR STABILITY

NOT FOR INSTALLATION IN
DRIVEWAYS

METER SIZE	A	B	C	D
3/4" x 3/4"	14-1/4"	9"	9"±	5"
1"	17-1/4"	10-3/4"	10"±	6"



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METER INSTALLATION
IN PIT FOR 3/4" & 1"
SERVICES

DATE 5/1/2016
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DRAWING
NUMBER
600-5

PLUG SHALL BE MECHANICALLY RESTRAINED:

-
- A - FOR SLEEVE TYPE MACHINED COUPLING PIPE, TIE BACK TO NEXT COUPLING.
- B - FOR BELL AND SPIGOT PIPE, TIE TO BELL.
- 1'-6"±
- 1'-6"±
- 3" GALVANIZED PIPE CAP IN A 6" VALVE BOX.
- 2" TYPE K SOFT COPPER PIPE
- 2" DRAIN & WASTE VALVE, OPERATING NUT & DRAIN.
- 12" PIPE OR SMALLER.
- PLUG WITH 2" TAP.
- BOND BREAKER.
- 90°
- CONCRETE KICKBLOCK.
- COPPER
- BRASS STREET ELBOW

3" GALVANIZED CAP

GROUND LINE

12" ±

16"

2" MALE I.P. THREAD X SOLDER ADAPTER, COVERED W/3" CAP.

6" FULL VALVE BOX (2 SECTIONS, TOP & CENTER FOR ADJUSTMENTS).

2" TYPE K SOFT COPPER PIPE

6" VALVE BOX (3 SECTIONS, TOP, CENTER & BELL).

2" DRAIN & WASTE VALVE, OPERATING NUT AND DRAIN.

2" TYPE K SOFT COPPER PIPE

PLUG WITH 2" TAP

KICKBLOCK NOT SHOWN

1 CU. FT. GRAVEL

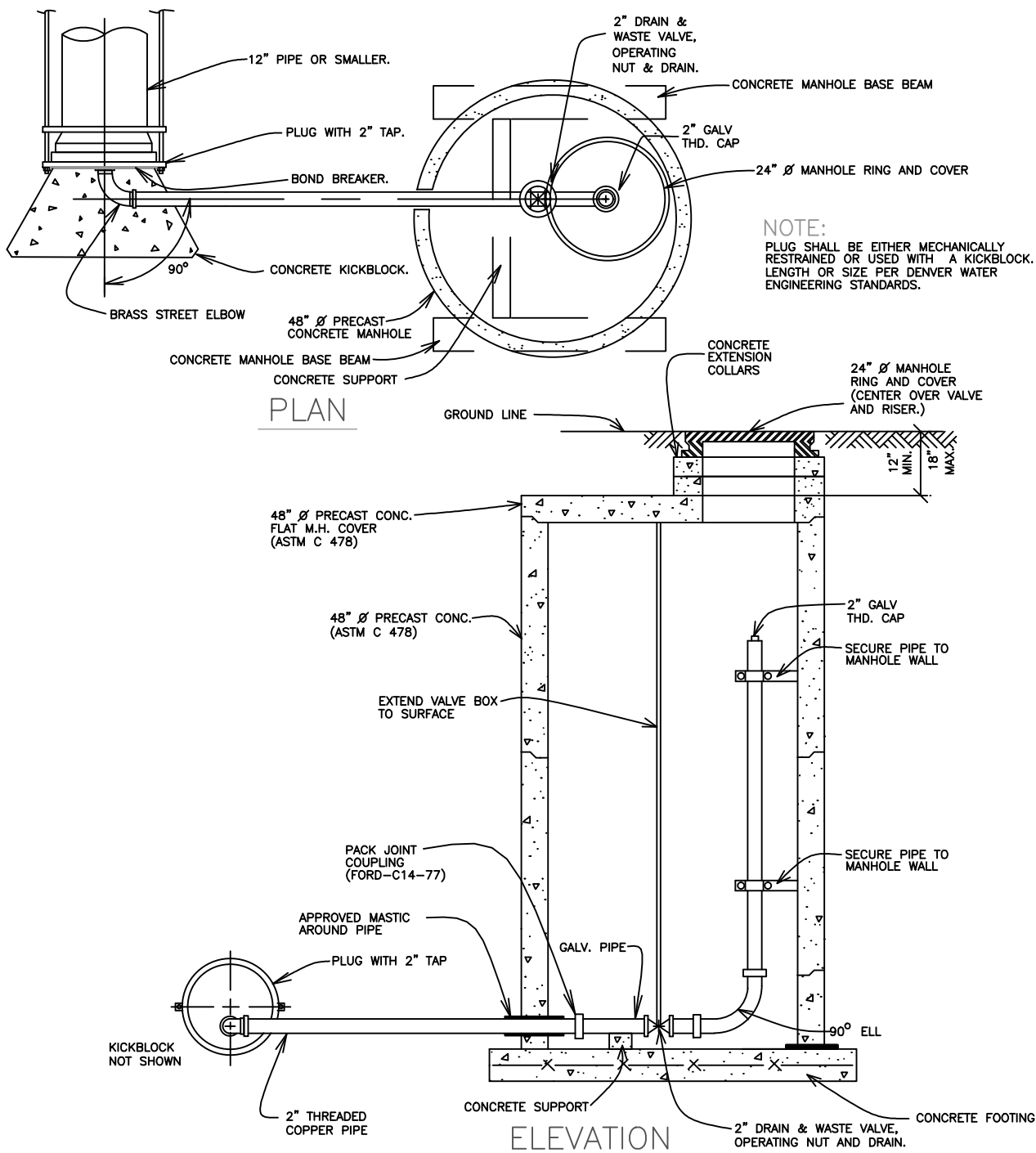


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TEMPORARY 2"
BLOW-OFF
INSTALLATION FOR
12" & SMALLER PIPE

DATE 5/1/2016
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DRAWING
NUMBER
600-6



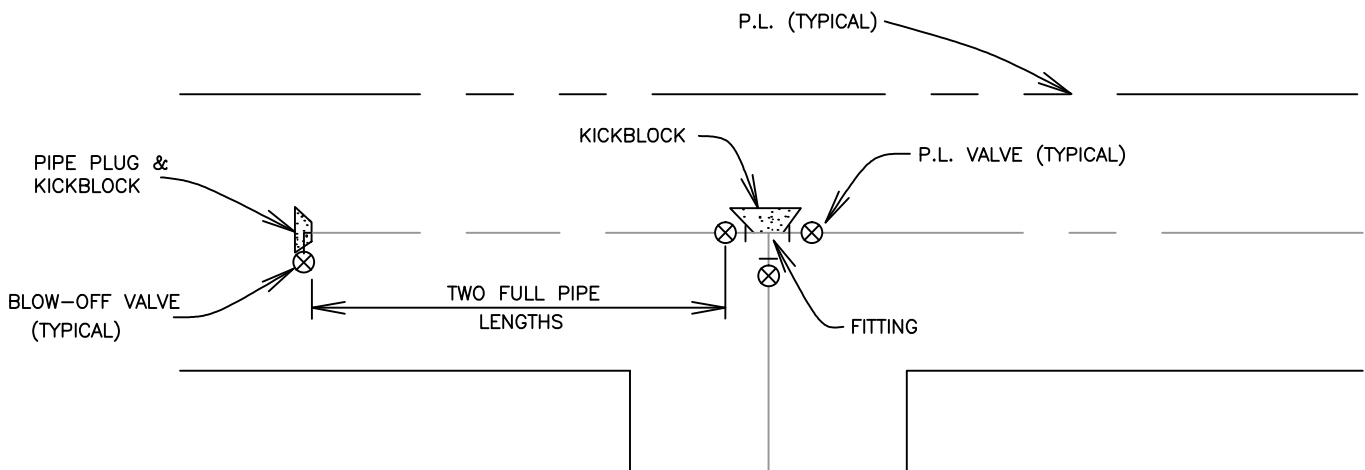
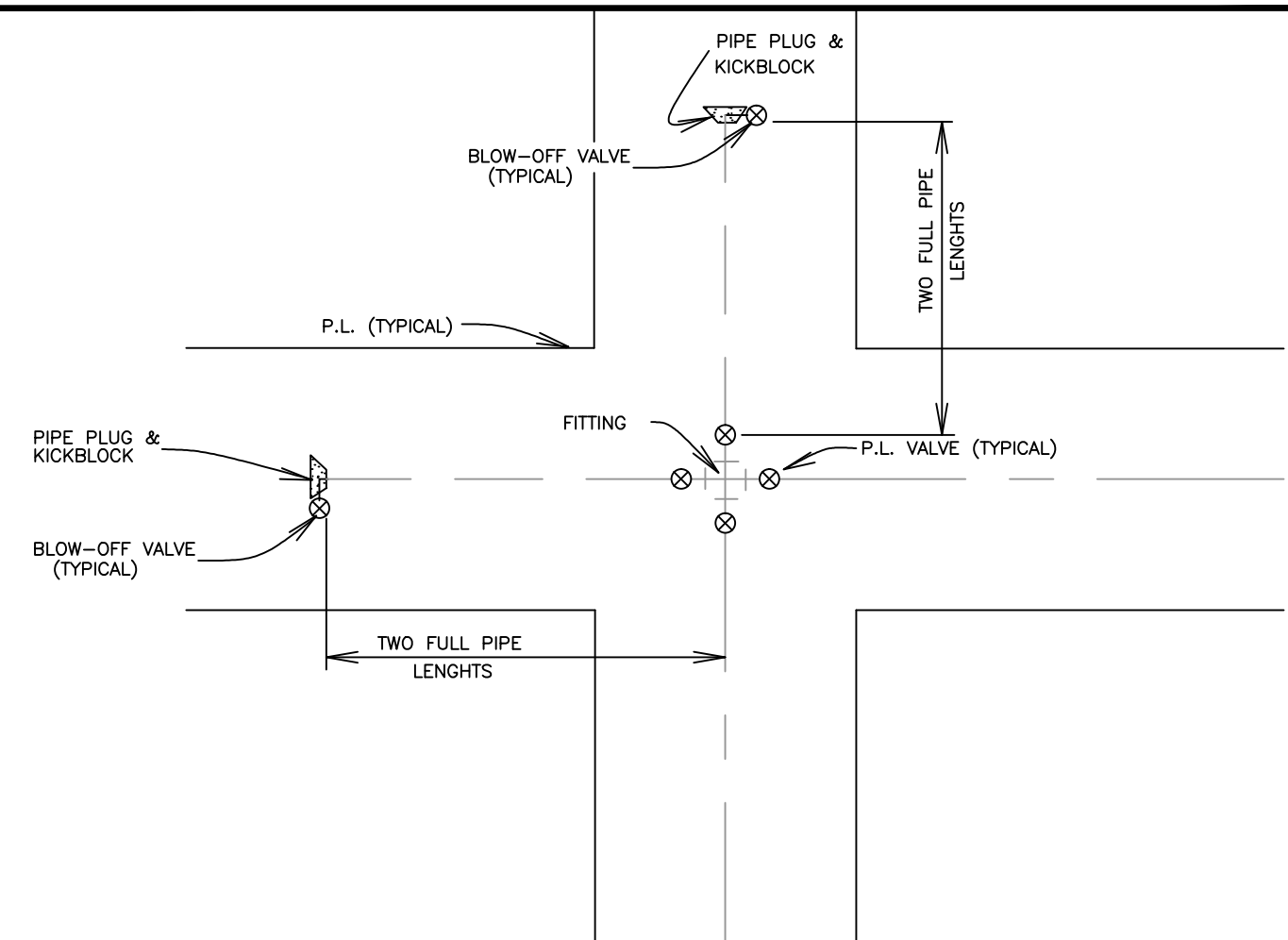
NOTE:
 WITH PRIOR APPROVAL OF DENVER WATER, A FIRE HYDRANT MAY BE SUBSTITUTED FOR THE PERMANENT 2" BLOWOFF. SEE SHEET 15 FOR EXTENSION GUIDE.



PERMANENT 2"
 BLOW-OFF
 INSTALLATION FOR
 12" & SMALLER PIPE

DATE 5/1/2016
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DRAWING
 NUMBER
 600-7



NOTES:

1. LAY PIPE FROM FITTING TO P.L.
2. VALVES TO BE CLUSTERED AROUND FITTING
3. STUB OUT TWO FULL PIPE LENGTHS FROM VALVE, PLUG END OF PIPE, INSTALL BLOWOFF AND KICK BLOCK

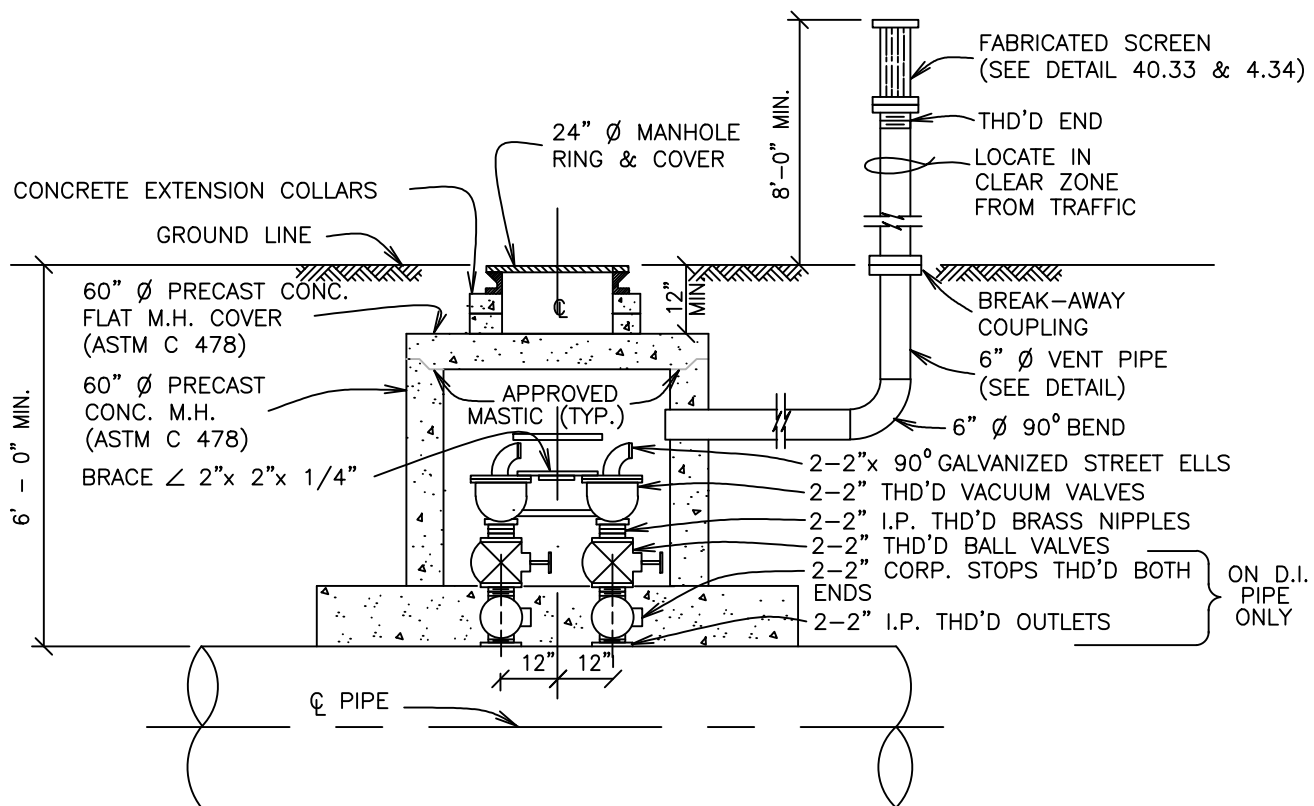


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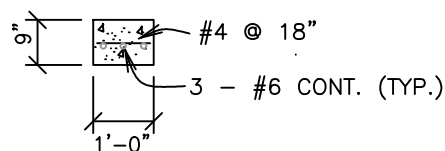
PIPING AT STREET
INTERSECTIONS &
FUTURE CONNECTIONS

DATE 5/1/2016
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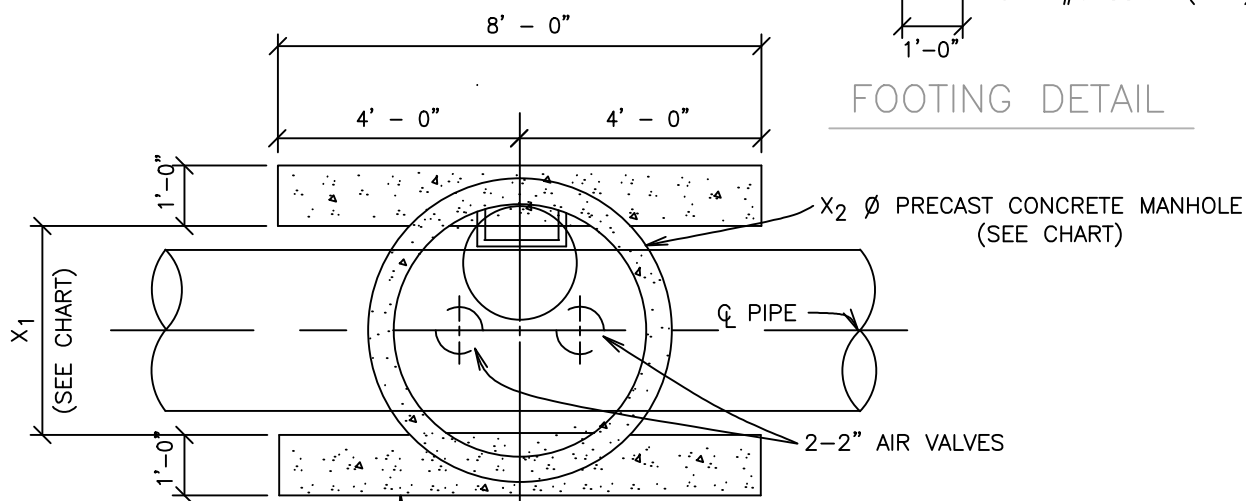
DRAWING
NUMBER
600-8



ELEVATION



FOOTING DETAIL



CONC. M.H. BASE BEAMS
9"x 1'-0"x 8'-0" REINF.
WITH BAR STEEL AS
SHOWN.

PLAN

PIPE DIAMETER	X1	X2
6" THRU 24"	$\emptyset + 24"$	48"
24" THRU 48"	$\emptyset + 24"$	60"

NOTES:

- 1.) USE 2" AIR VALVE ASSEMBLY ON 30" OR SMALLER PIPE.
- 2.) THE DISTANCE BETWEEN RUNGS, CLEATS, AND STEPS SHALL NOT EXCEED 12 INCHES AND SHALL BE UNIFORM THROUGHOUT THE LENGTH OF THE LADDER.
- 3.) LADDER RUNGS ARE REQUIRED IN PRECAST CONCRETE MANHOLES.



2" AIR VACUUM
VALVE
INSTALLATION

DATE 5/1/2016
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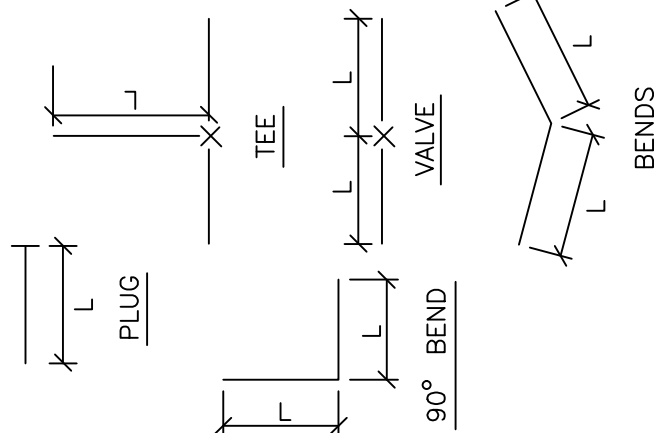
DRAWING
NUMBER
600-10

LENGTH OF RESTRAINED PIPE

PIPE SIZE	4"			6"			8"			12"			16"			20"			24"		
	D	L	G	D	L	G	D	L	G	D	L	G	D	L	G	D	L	G	D	L	G
90° BEND	3/4"	30'	M.S.	3/4"	45'	M.S.	3/4"	60'	M.S.	3/4"	86'	H.S.	1"	108'	H.S.	1 1/4"	132'	H.S.	—	155'	—
TEE, PLUG OR VALVE																					
45° BEND	3/4"	9'	M.S.	3/4"	13'	M.S.	3/4"	18'	M.S.	3/4"	25'	M.S.	1"	32'	M.S.	3/4"	39'	H.S.	—	45'	—
22 1/2° BEND	3/4"	1'	M.S.	3/4"	4'	M.S.	3/4"	5'	M.S.	3/4"	7'	M.S.	3/4"	8'	M.S.	3/4"	10'	M.S.	—	12'	—
11 1/4° BEND	—	—	—	—	—	—	3/4"	1'	M.S.	3/4"	2'	M.S.	3/4"	2'	M.S.	3/4"	3'	M.S.	—	3'	—

NOTES:

- 1.) LENGTH OF RESTRAINED PIPE MEASURED EACH WAY FROM VALVES AND BENDS.
- 2.) D=DIAMETER, L=LENGTH, G=GRADE
- 3.) M.S.=MILD STEEL, H.S.=HIGH STRENGTH.
- 4.) MINIMUM 4.5' GROUND COVER REQUIRED.
- 5.) BASED ON 150 PSI INTERNAL PRESSURE.
- 6.) M.S. = MILD STEEL ROD ASTM A36.
- 7.) H.S. = HIGH STRENGTH ROD ASTM A193 GRADE B7.
- 8.) NUTS SHALL BE ASTM A307 GRADE A OR B HEXAGON HEAVY SERIES, HIGH STRENGTH NUTS SHALL BE ASTM A194, GRADE 2H.
- 9.) SEE TIE ROD DETAIL DRAWING. ALSO, TIE ROD COUPLING DETAILS, CLAMP DETAILS AND SET CLAMP DETAILS.
- 10.) LENGTH REFERS TO THE AMOUNT OF PIPE WHICH MUST BE RESTRAINED TOGETHER AND IS NOT NECESSARILY THE LENGTH OF THE RODS.
- 11.) LENGTH OF RESTRAINED PIPE CHART IS ALSO FOR THE LENGTH OF JOINT RESTRAINT FOR MEGLUGS.
- 12.) TEE AND CROSS MUST BE RESTRAINED IN ALL APPLICABLE DIRECTIONS.



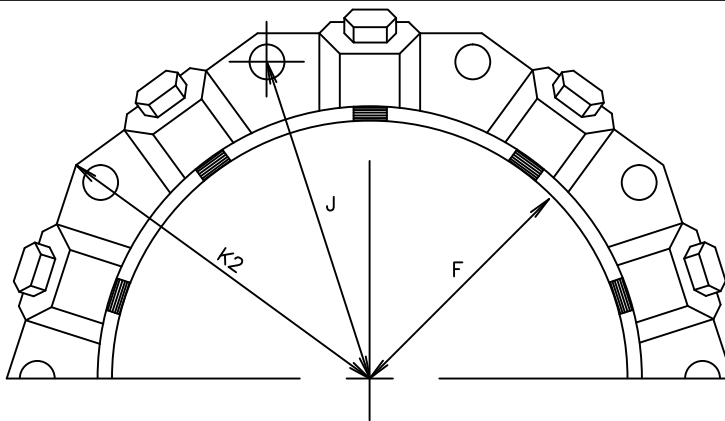
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RESTRAINED PIPE
LENGTHS

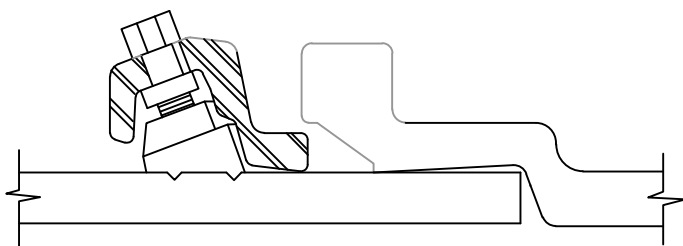
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DRAWING
NUMBER

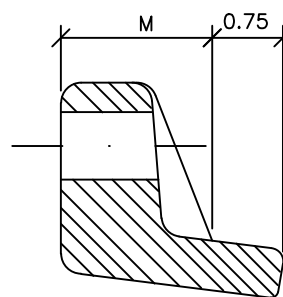
600-11



MECHANICAL JOINT RESTRAINT



WEDGE DETAIL



BOLT HOLE DETAIL

DIMENSIONS

	NOMINAL PIPE SIZE	NO. OF BOLTS	NO. OF WEDGES	K2 INCHES	J INCHES	F INCHES	M INCHES	
P V C	4"	2	2					P V C
	6"	6	3	11.12	9.50	7.00	0.88	
	8"	6	4	13.37	11.75	9.15	1.00	
	10"	8	6	15.62	14.00	11.20	1.00	
	12"	8	8	17.88	16.25	13.30	1.25	
D I	4"	4	2					D I
	6"	6	3	11.12	9.50	7.00	0.88	
	8"	6	4	13.37	11.75	9.15	1.00	
	10"	8	6	15.62	14.00	11.20	1.00	
	12"	8	8	17.88	16.25	13.30	1.25	

NOTES:

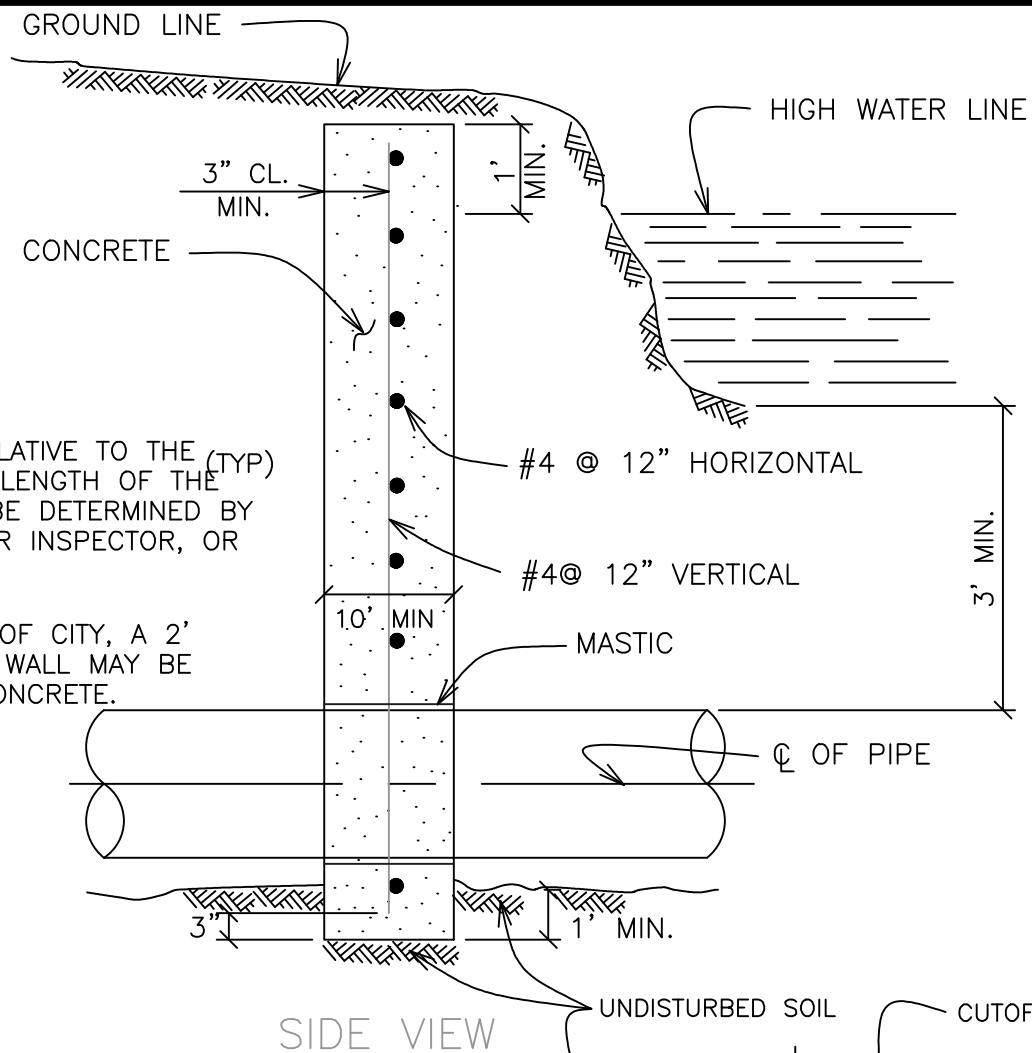
- 1.) REFER TO MS-28 OR SECTION 6.05 PARAGRAPH D.
- 2.) DIMENSIONS FOR 16" AND 20" D.I. PIPE NOT SHOWN.
- 3.) OTHER MECHANICAL JOINT RESTRAINT DEVICES MUST BE APPROVED BEFORE INSTALLATION.



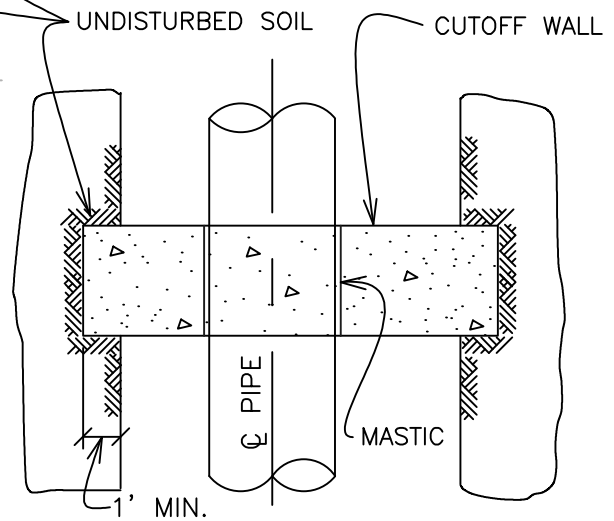
MECHANICAL JOINT
RESTRAINT

DATE 5/1/2016
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DRAWING
NUMBER
600-12

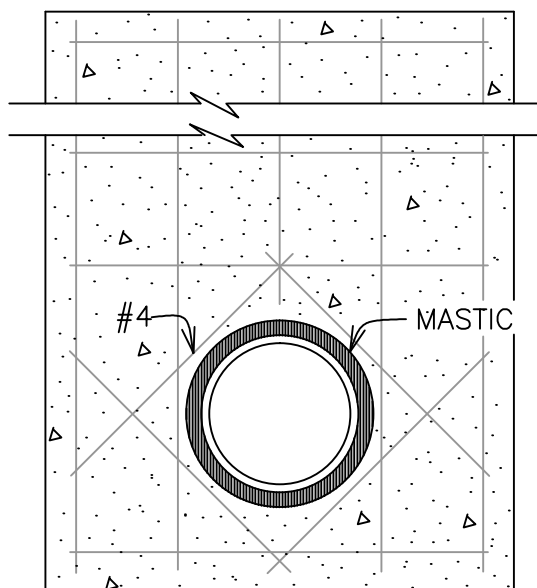


SIDE VIEW



TOP VIEW

NOTE:
REINFORCEMENT
NOT SHOWN.



FRONT VIEW

NOTE:

1. THE LOCATION RELATIVE TO THE (TYP) CANAL, HEIGHT AND LENGTH OF THE CUTOFF WALL WILL BE DETERMINED BY THE BRIGHTON WATER INSPECTOR, OR OWNER.

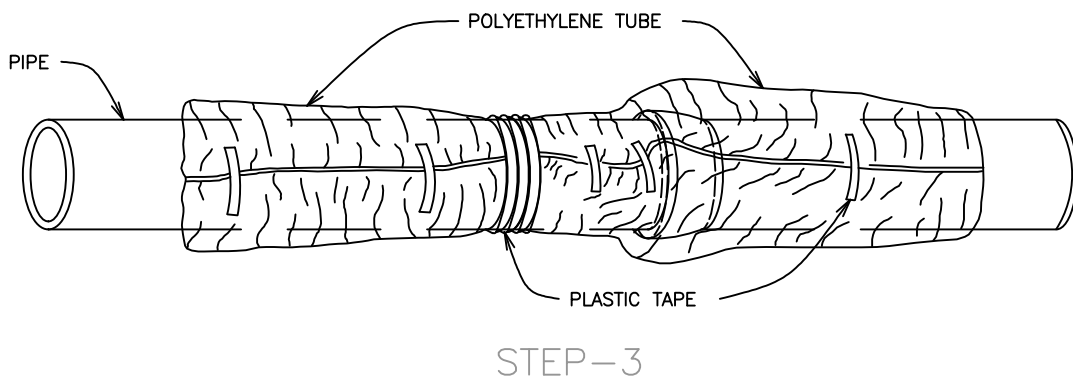
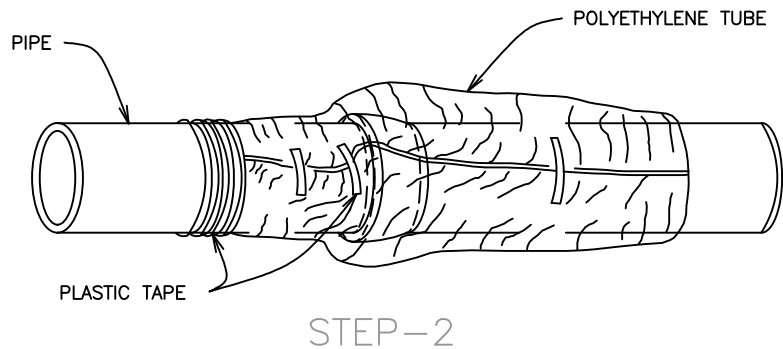
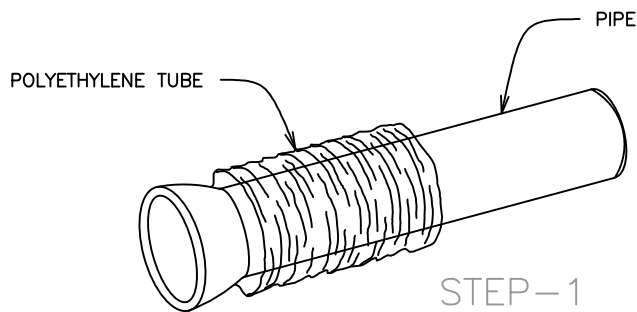
2. UPON APPROVAL OF CITY, A 2' THICK CLAY CUTOFF WALL MAY BE SUBSTITUTED FOR CONCRETE.



TYPICAL CUTOFF
WALL FOR CANAL
CROSSING

DATE 5/1/2016
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DRAWING
NUMBER
600-13



FIELD INSTALLATION-POLYETHYLENE WRAP

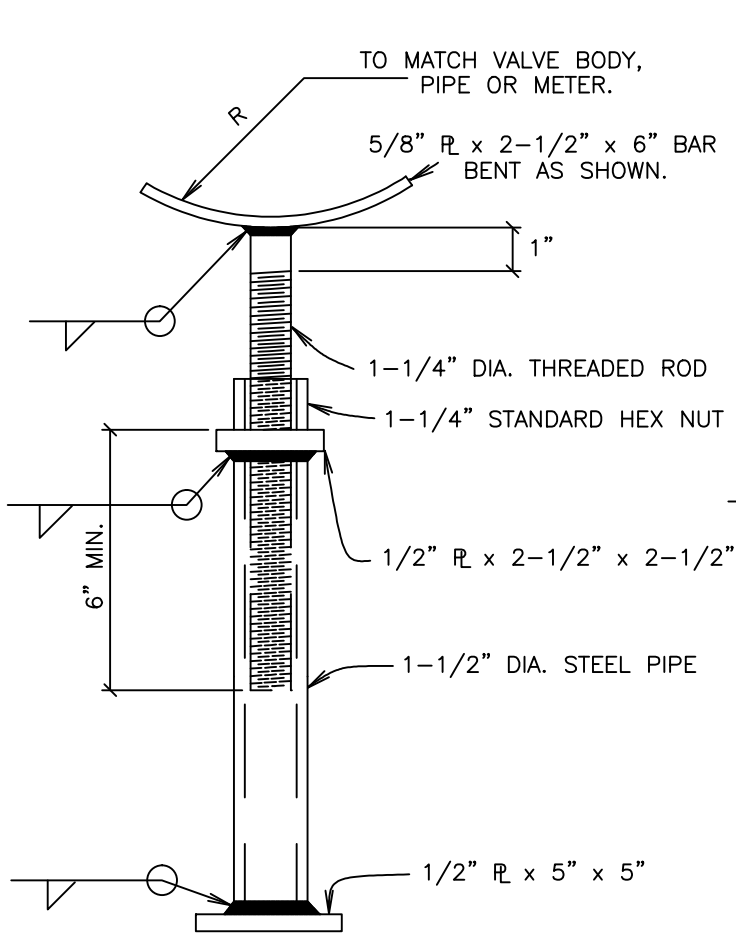
- STEP-1 PLACE TUBE OF POLYETHYLENE MATERIAL AROUND PIPE PRIOR TO LOWERING PIPE INTO TRENCH.
- STEP-2 PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH THREE CIRCUMFERENTIAL TURNS OF TWO-INCH WIDE PLASTIC TAPE TO HOLD PLASTIC TUBE AROUND SPIGOT END.
- STEP-3 ADJACENT TUBE OVERLAPS FIRST TUBE AND IS SECURED WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE WILL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED INTO AN OVERLAP ON TOP OF THE PIPE AND HELD IN PLACE BY MEANS OF PIECES OF THE PLASTIC TAPE AT APPROXIMATELY THREE TO FIVE FOOT INTERVALS.



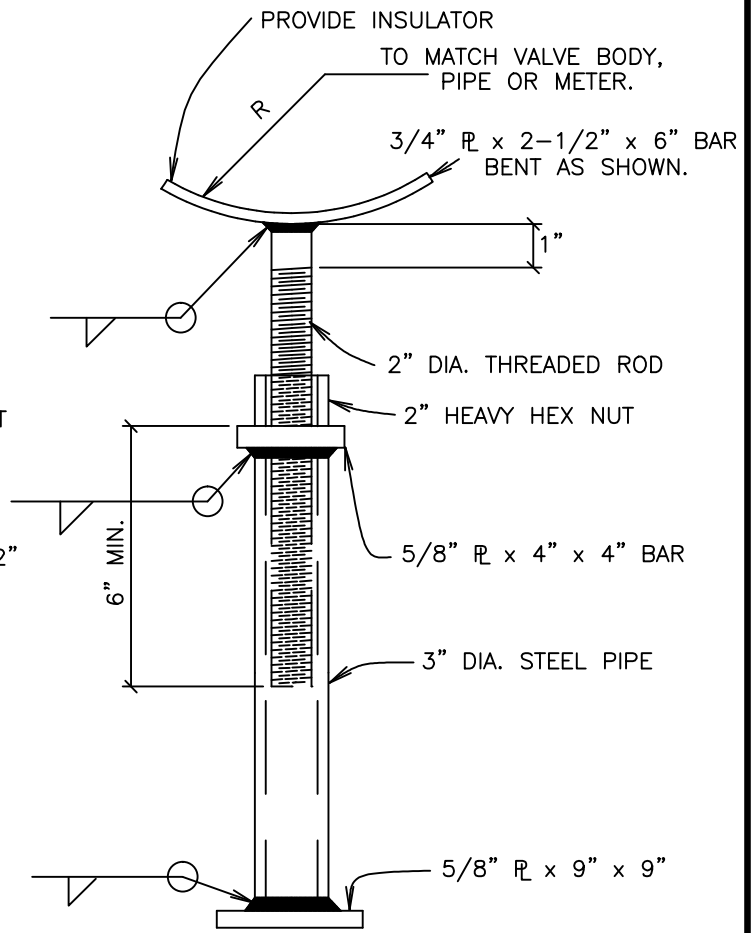
POLYETHYLENE WRAP

DATE 5/1/2016
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DRAWING
NUMBER
600-14



ADJUSTABLE-SUPPORT
(STANDARD)



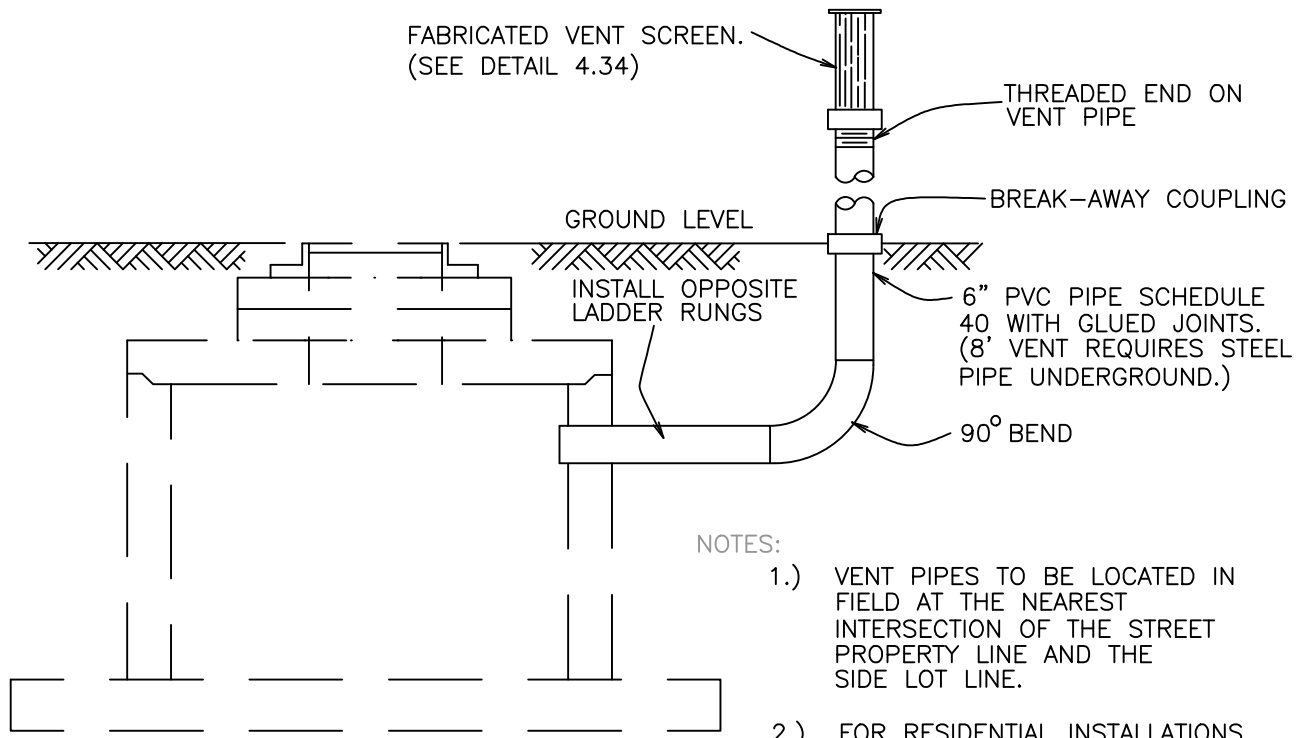
ADJUSTABLE-SUPPORT
(HEAVY DUTY)



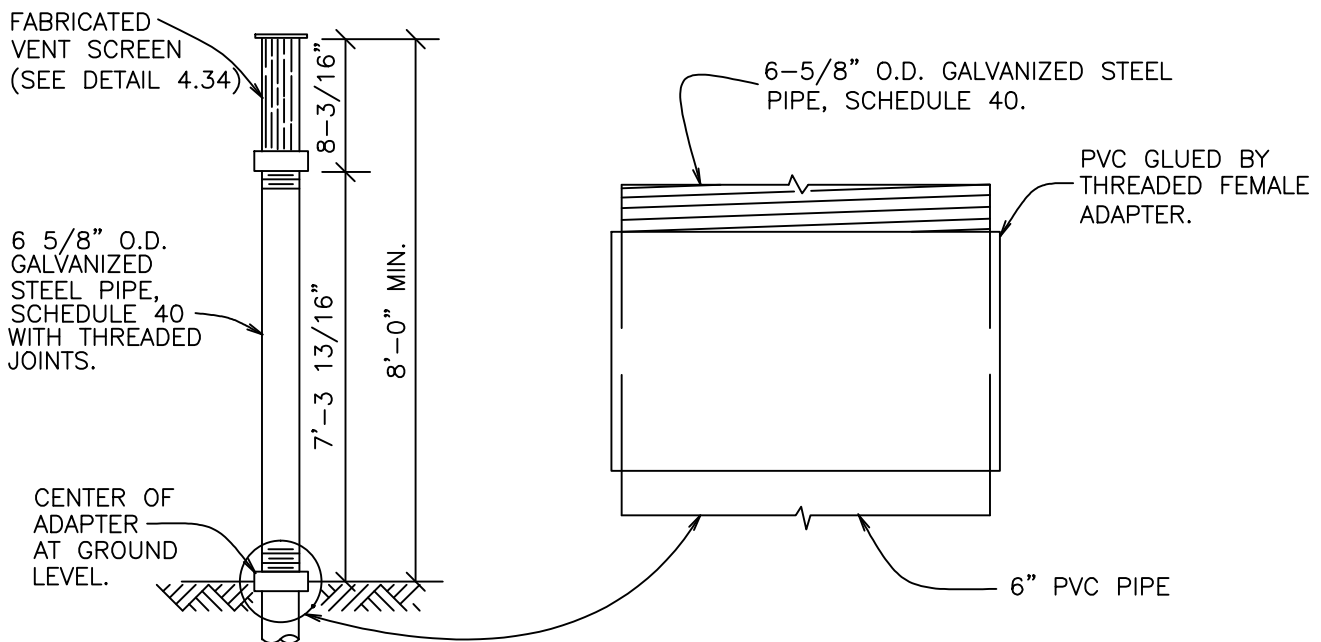
ADJUSTABLE STEEL
PIPE VALVE
SUPPORT

DATE 5/1/2016
REVISED BY CWB

DRAWING
NUMBER
600-15



VENT PIPE INSTALLATION



VENT PIPE AND BREAK-AWAY COUPLING DETAILS

NOTE:
VENT PIPE MUST BE LOCATED IN CLEAR ZONE FROM TRAFFIC. LOCATION MUST BE APPROVED BY THE CITY.



VENT PIPE
INSTALLATION

DATE 5/1/2016
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DRAWING
NUMBER
600-16

7" Ø 3/16" R

1/2"

1/8"

3/4" NO. 9-11
FLATTENED EXPANDED
METAL SCREEN.
(GALVANIZED)

6-3/4" O.D.

6"

1/2" x 1/8"

1/8"

6" GALV. ONE-HALF
COUPLING (7.35" O.D.)
FOR 6-5/8" O.D. PIPE.
CUT FROM 4-1/8" LONG
COUPLING.

ELEVATION

SCREEN FOR 6" VENT PIPE

1'-9 1/4"

6"

METAL SCREEN

1-11/16"

9/16"



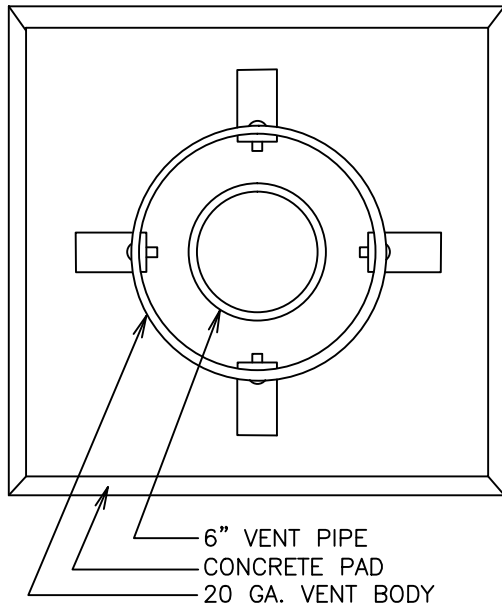
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6" DIAMETER VENT
PIPE SCREEN

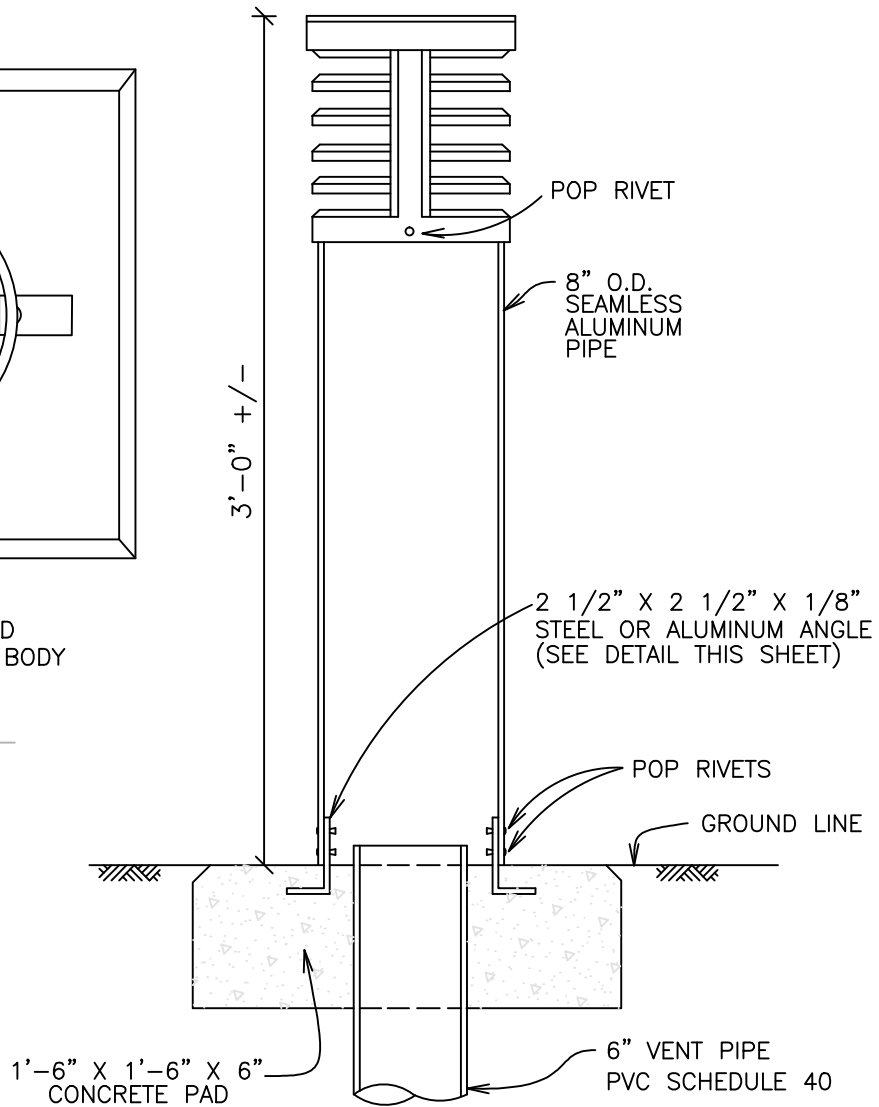
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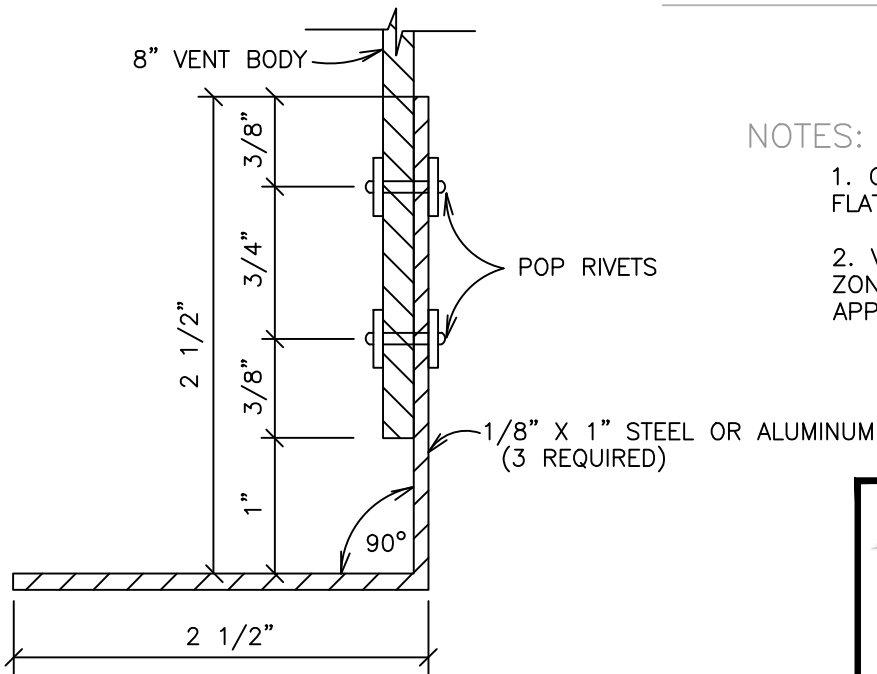
600-17



BASE DETAIL



ROUND VENT SCREEN



NOTES:

1. COLOR SHALL BE OLIVE GREEN OR FLAT BLACK TO MATCH SURROUNDINGS.
2. VENT PIPE MUST BE LOCATED IN CLEAR ZONE FROM TRAFFIC. LOCATION MUST BE APPROVED BY THE CITY.



RESIDENTIAL VENT
ASSEMBLY

DATE 5/1/2016
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NUMBER

600-18

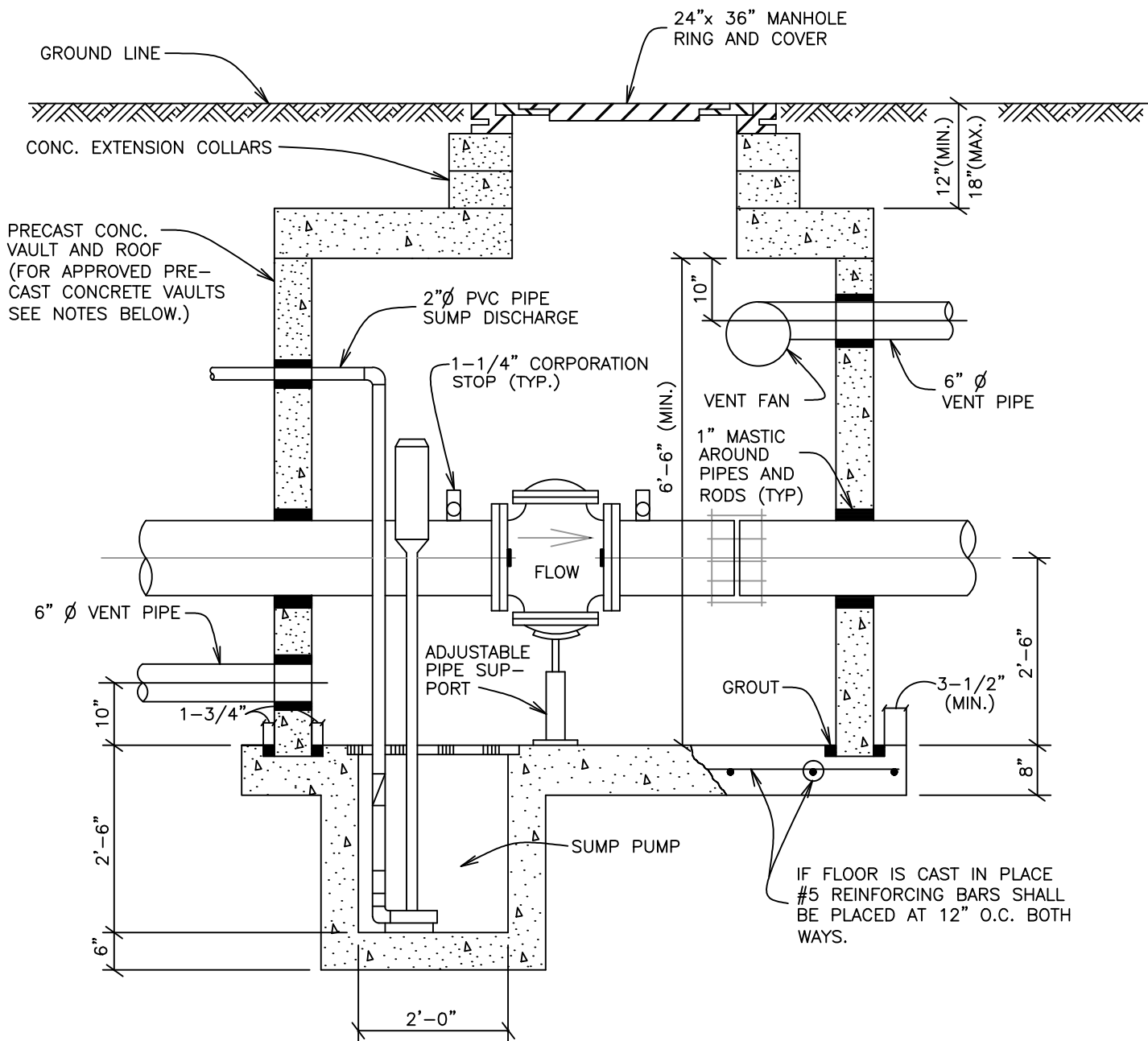
STEEL OR ALUMINUM ANGLE DETAIL



PRESSURE REGULATING VALVE MANHOLE INSTALLATION CROSS SECTION


DATE 5/1/2016
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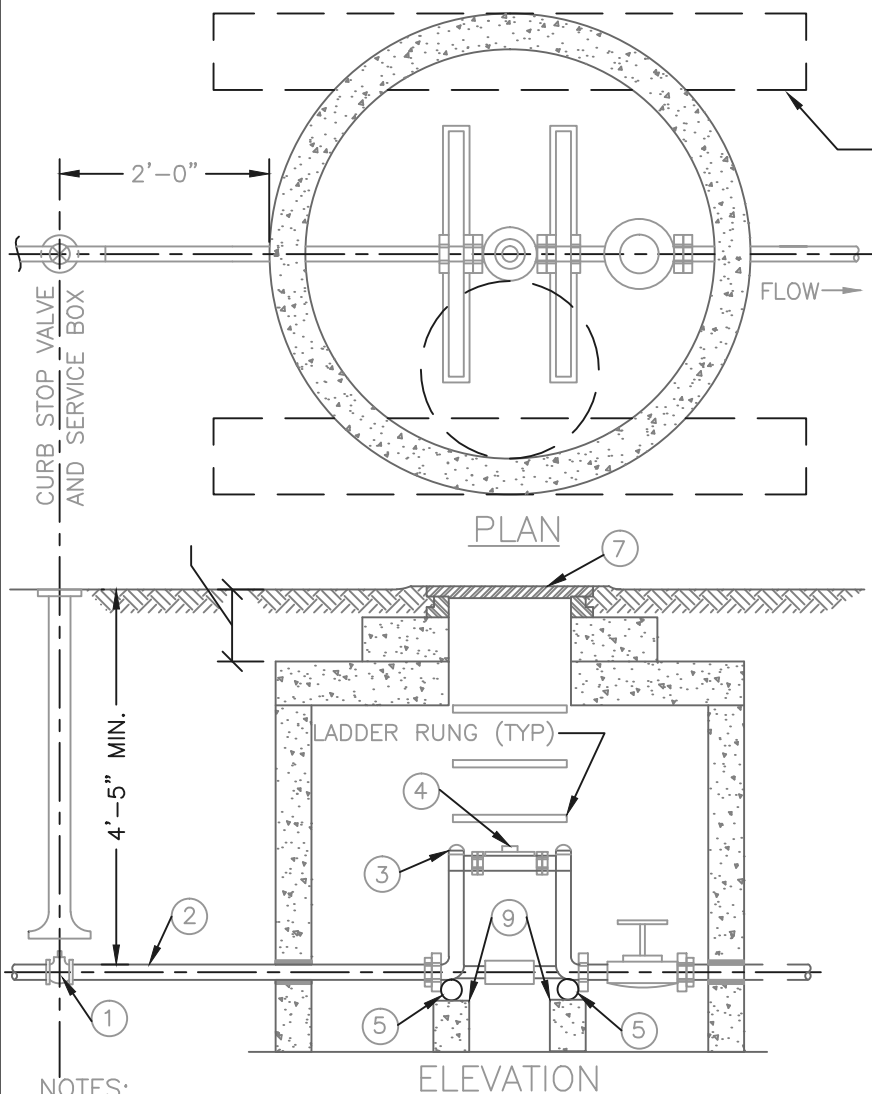
DRAWING
NUMBER
600-19



NOTES:

- 1.) APPROVED PRECAST CONCRETE VAULTS:
AMCOR CONC. INC.- 10' X 10' X 7' 7080M, 7080-12.
ADAMS CITY MFG.-11' X 12', 6' X 8'-6", 7' X 12'-6"
- 2.) A PERMIT IS REQUIRED FOR SUMP PUMP DISCHARGE TO STORM SEWERS.
- 3.) SEE SHEET 4.38 FOR PLAN VIEW AND ADDITIONAL NOTES.

 Brighton	DATE 5/1/2016 REVISED BY CWB
	<p>PRESSURE REGULATING VALVE RECTANGULAR VAULT CROSS SECTION</p> <p>DRAWING NUMBER 600-28</p>



OPTIONAL CONCRETE MANHOLE BASE BEAMS
(SEE DETAIL SHEET NO. 4.14)

- ① CURB STOP
- ② TYPE K COPPER TUBING
- ③ 12" COPPERSETTER WITH BALL VALVE AND CHECK VALVE
- ④ METER UNIT
- ⑤ 1" X 23" COPPER OR PLASTIC PIPE
- ⑥ BY-PASS WILL BE 1" FOR 1-1/2" COPPERSETTERS AND 1-1/4" OR 1-1/2" FOR 2" COPPERSETTERS.
- ⑦ 24" COVER WITH "WATER" LETTERING
- ⑧ 48" CONE MANHOLE
- ⑨ CONCRETE BLOCK SUPPORTS 4" X 4" X 24"

NOTES:

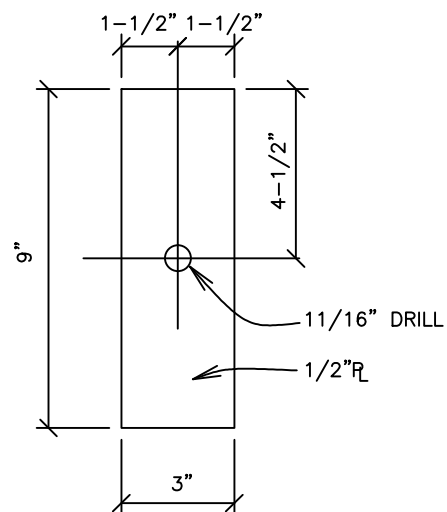
1. METER SETTING MUST BE INSPECTED BEFORE BACKFILLING.
2. BYPASS IS TO BE INSTALLED UNLESS OTHERWISE SPECIFIED.
3. NO CONCRETE TO BE LAID IN FLOOR OF METER PIT.
4. PIPING SHALL BE TYPE "K" COPPER.
5. IF GROUND CONDITIONS ARE UNSTABLE, THE ENGINEER MAY REQUIRE THAT FOOTINGS BE INSTALLED.
6. THE WORD "WATER" SHALL BE CAST ON THE LID.
7. 3/4" OR 1-1/2" ROCK SHALL BE PLACED IN THE FLOOR OF METER PIT 6" THICK.
8. SUPPORT UNDER METER MAY BE BRICK OR CONCRETE BLOCK.
9. COMPRESSION JOINTS MUST BE USED INSIDE VAULT.
10. LOCATION OF METER TO BE APPROVED BY THE CITY ENGINEER OR WATER SUPERVISOR.
11. ALL SETTINGS MUST BE INSPECTED BY THE CITY.
12. IF THE STREET OR GROUND IS NOT TO FINAL GRADE AT THE TIME OF INSTALLATION OF THE METER, THE OWNER MUST RAISE OR LOWER THE METER WHEN THE FINAL GRADE IS ESTABLISHED. SEE STANDARD DETAIL.
13. JOINTS AND GALVANIZED PIPING SHALL NOT BE ALLOWED INSIDE THE METER SETTING.
14. A BYPASS IS REQUIRED ON ALL METERS 1-1/2 INCH AND LARGER UNLESS OTHERWISE SPECIFIED BY CITY ENGINEER.
15. THE SERVICE LINE THROUGH AND ON BOTH SIDES OF THE METER PIT MUST BE OF TYPE K COPPER PIPE.
16. NO CONNECTIONS SHALL BE MADE IN THE METER PIT. ANY CONNECTIONS MUST BE MADE MORE THAN 5 FEET FROM THE METER PIT ON THE DOWNSTREAM SIDE.
17. OTHER METER SETTINGS:
SETTINGS OF METERS OTHER THAN SHOWN AND DETAILED HEREIN SHALL BE CONSIDERED AS NON-STANDARD AND SHALL REQUIRE APPROVAL OF PROPOSED PIPING LAYOUT, METER SETTINGS AND STRUCTURAL DESIGN OF VAULT FOR EACH SEPARATE INSTALLATION.
18. BACKFLOW PREVENTION DEVICES WILL BE REQUIRED.



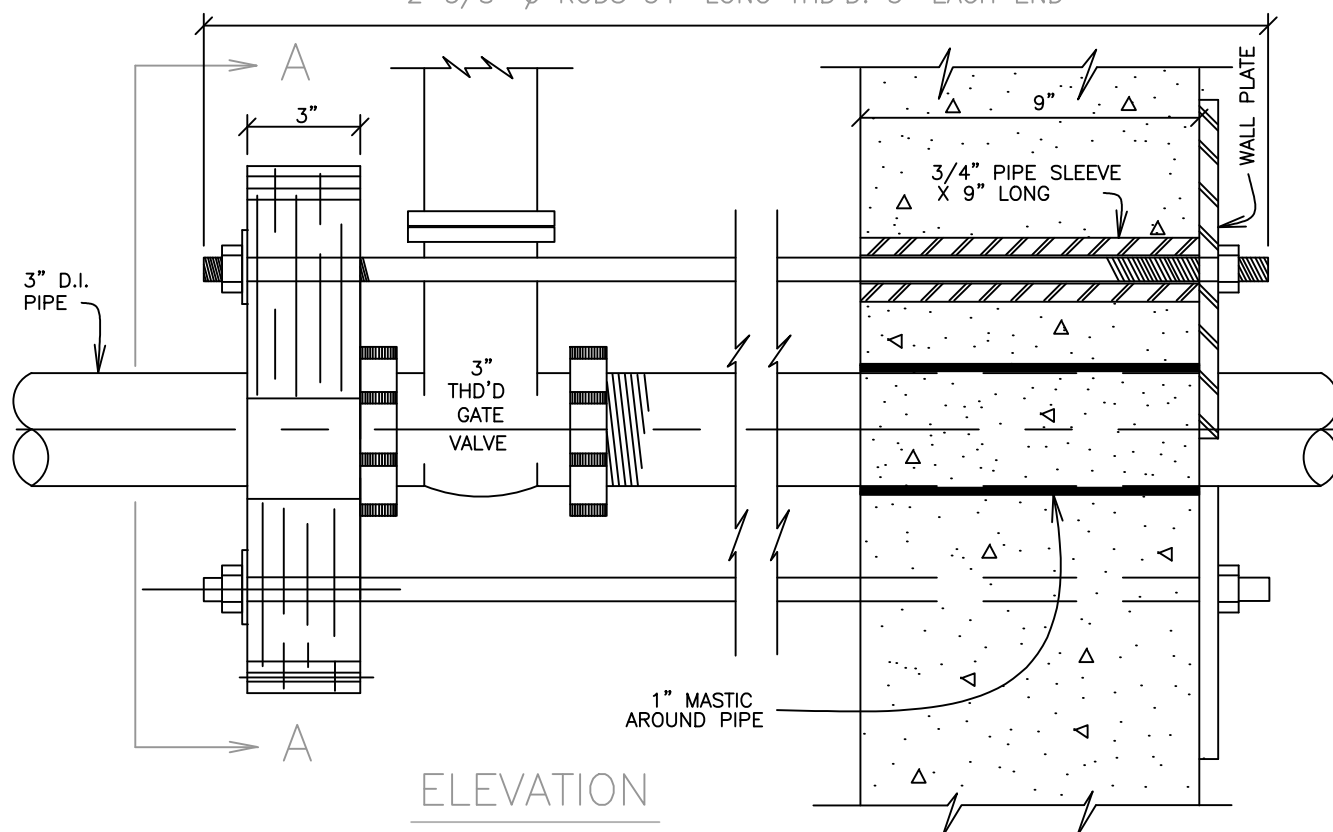
METER INSTALLATION
IN MANHOLE FOR
1-1/2" OR 2"
SERVICES

DATE 5/1/2016
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DRAWING
NUMBER
600-20

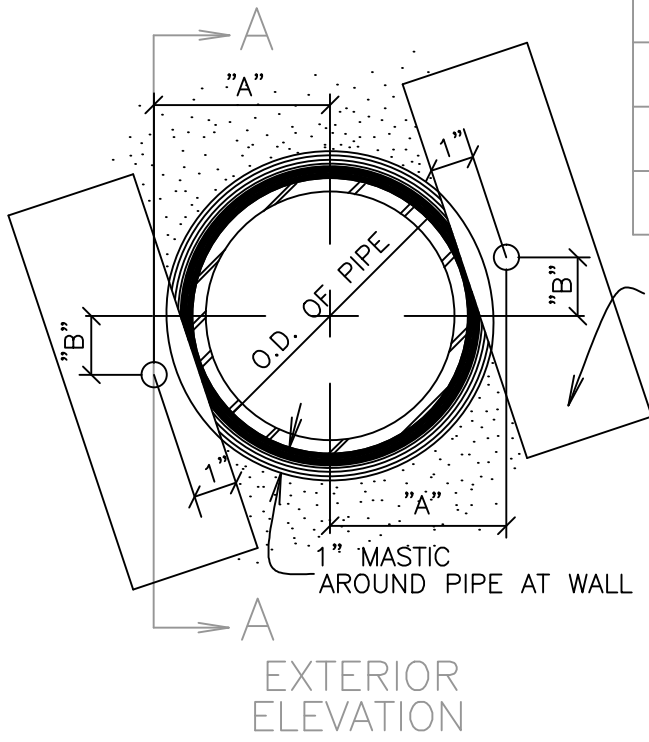


4 REQUIRED

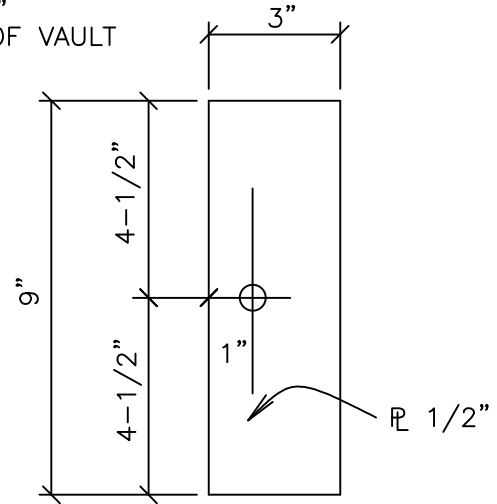


600-21

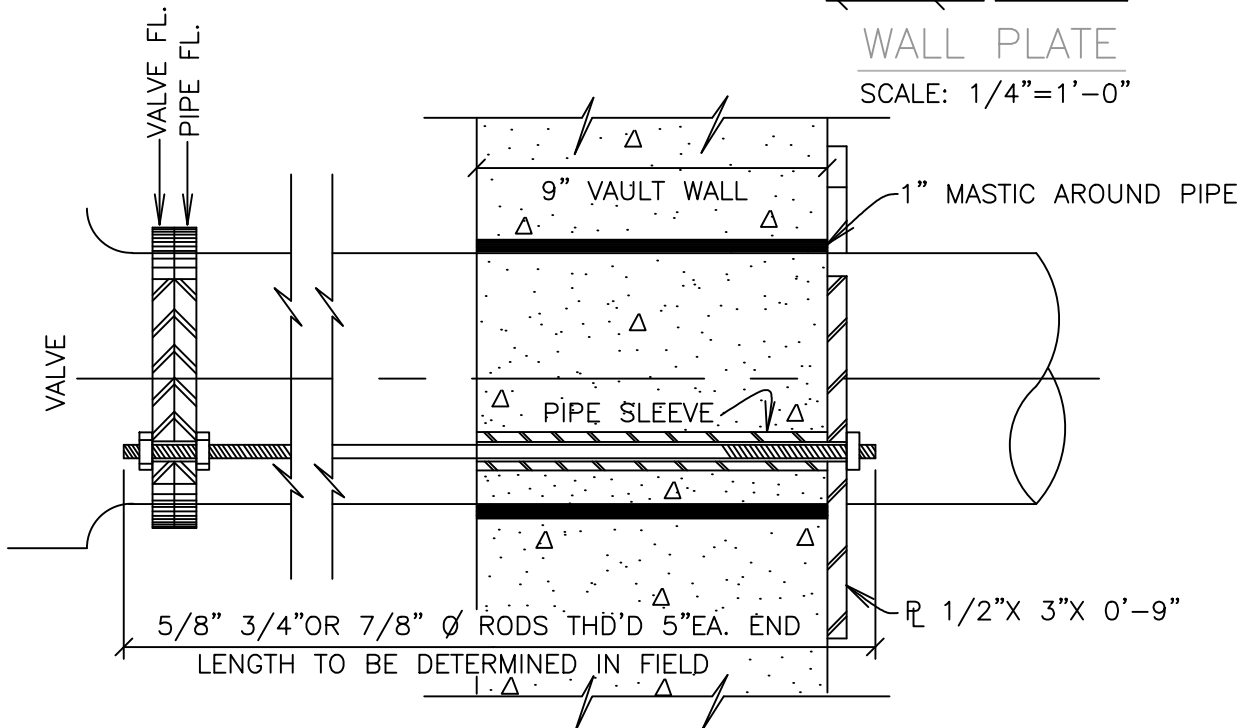
PIPE SIZE	RODS NO. & SIZE	WALL PIPE SLEEVES	"A"	"B"
4"	2- 5/8" ϕ	3/4"X 9"	3 1/2"	1 7/16"
6"	2- 5/8" ϕ	3/4"X 9"	4 3/8"	1 13/16"
8"	2- 3/4" ϕ	1"X 9"	5 7/16"	2 1/4"
10"	2- 7/8" ϕ	1-1/2"X 9"	5 7/8"	3 3/8"



PL 1/2"X3"X9"
2-EA. END OF VAULT



SCALE: 1/4"=1'-0"

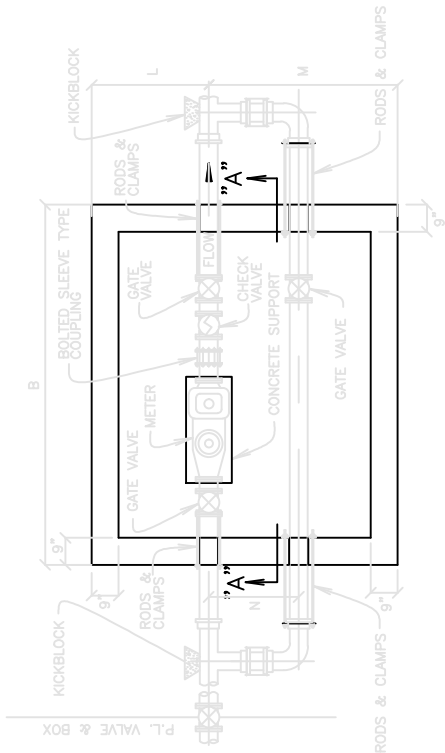


WALL PLATES FOR
4", 6", 8" AND 10"
METERS

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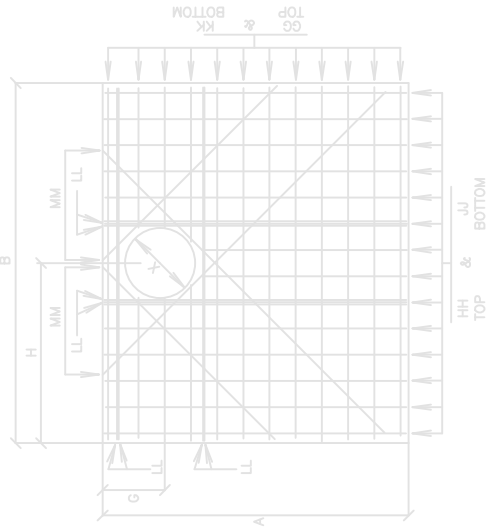
DRAWING
NUMBER
600-22

LL= TOP OR BOTTOM MM= BOTTOM ONLY



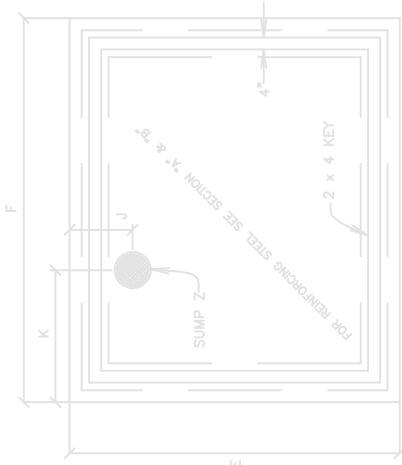
PLAN OF PIPING

NOTE:
1" MASTIC TYP. @ ALL
RODS THRU WALLS.

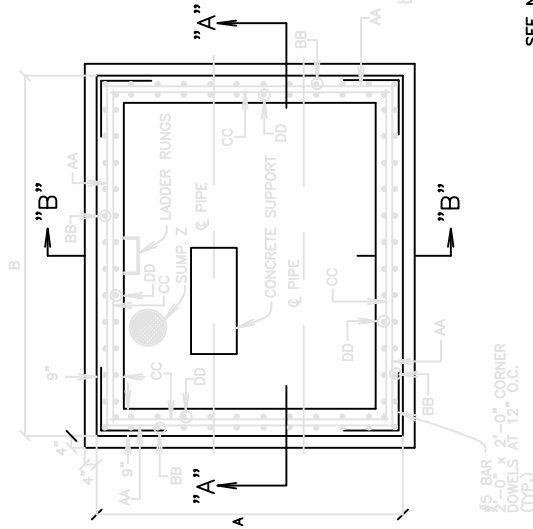


ROOF SLAB

NOTE:
THE ROOF SLAB MAY BE CAST
IN SECTIONS FOR FUTURE ACCESS.
THE INDIVIDUAL SECTION WEIGHT
MUST NOT EXCEED 7,500 POUNDS

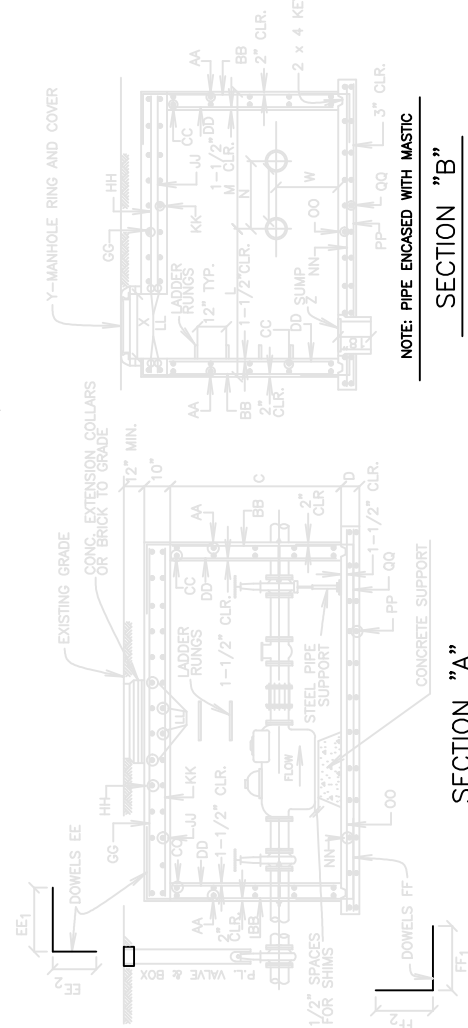


FLOOR SLAB



PLAN OF VAULT

SEE NEXT SHEET FOR DIMENSIONS
CORRESPONDING TO THIS DRAWING.



SECTION "A"

SECTION "B"

NOTE:
THE DISTANCE BETWEEN RUNGS, CLEATS, AND STEPS
SHALL NOT EXCEED 12 INCHES AND SHALL BE UNIFORM
THROUGHOUT THE LENGTH OF THE LADDER.

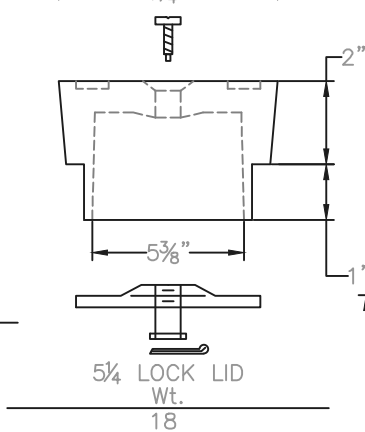
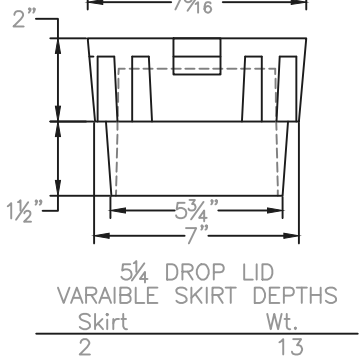
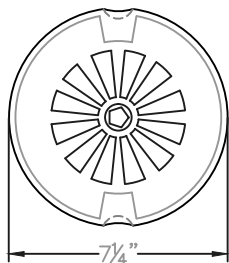
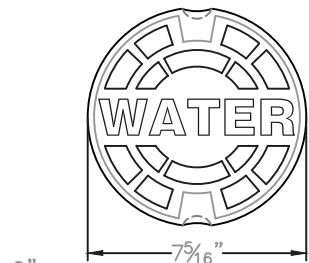


COMPOUND METER
WITH BOTH CHECK
VALVE AND BYPASS

DATE 5/1/2016
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NUMBER

600-23

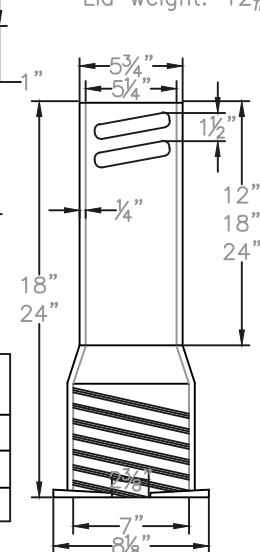


Item	Height Increase	Wt.
58	14	28
59	18	35
60	24	42

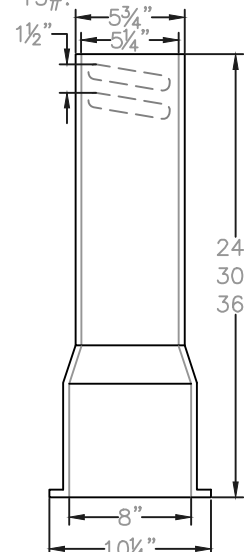
EXTENTION			TOP SECTION		BOTTOM SECTION	
Item	In "	Wt.	L=	Wt.	L=	Wt.
C.I.-462-S	27-32	70	10	35	24	35
C.I.-562-S	27-37	80	16	32	24	35
C.I.-563-S	33-43	85	16	32	30	40
C.I.-564-S	39-50	90	16	32	36	44-45
C.I.-662-S	36-52	105	26	48-52	30	40
C.I.-664-S	39-60	110	26	48-52	36	44-48
C.I.-666-S	51-71	135	26	48-52	**48	70
C.I.-668-S	62-82	145	26	48-52	**60	80

All weights are approximate.
Lid weight: 12#-13#.

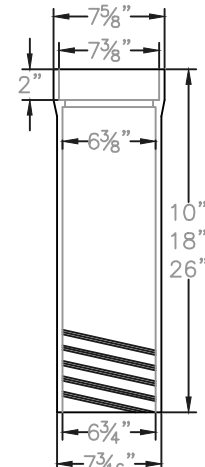
**May be furnished in two pieces screwed together to make the length required.



58 & 59 EXTENTION



BOTTOM SECTION



TOP SECTION

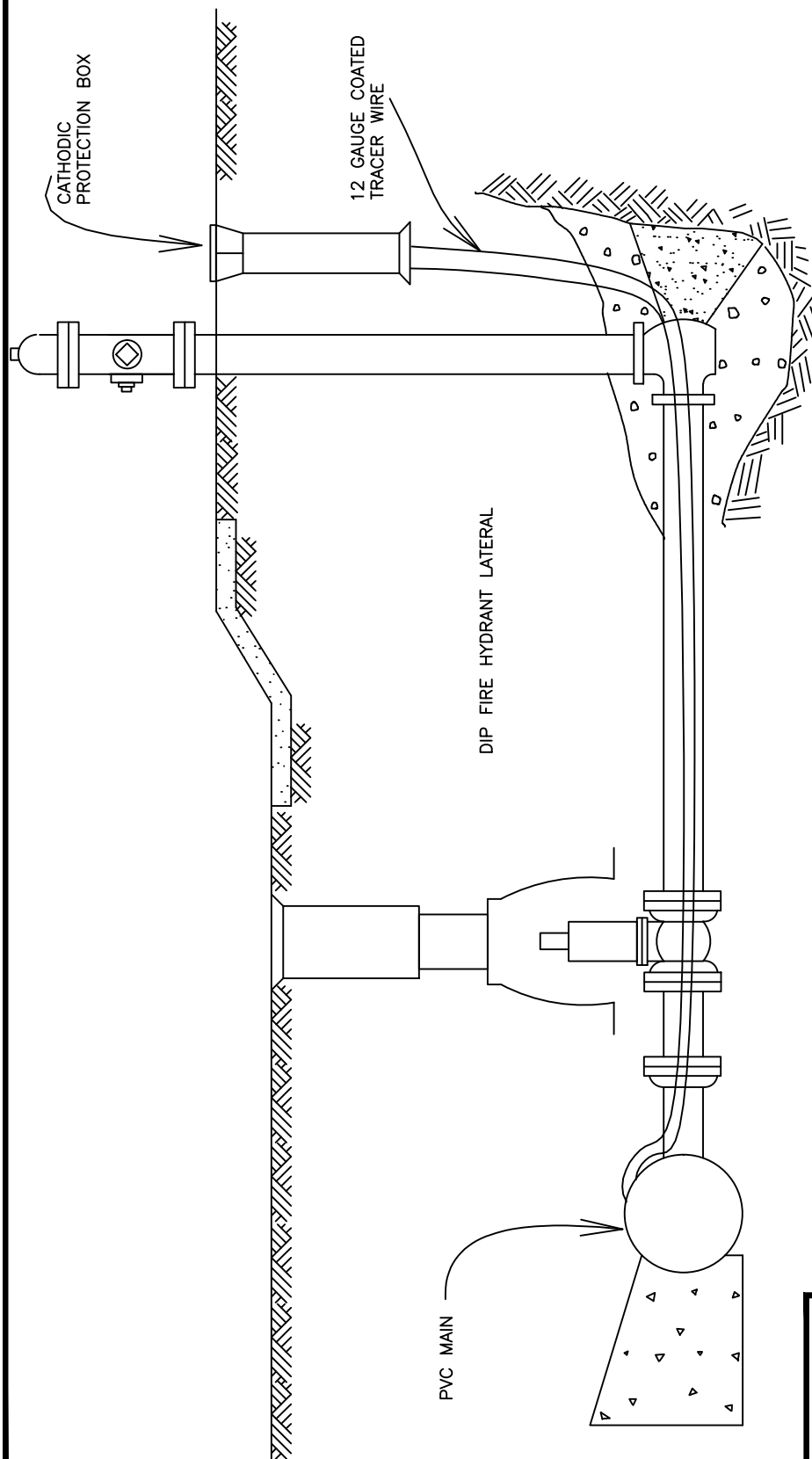


VALVE BOX

DATE 5/1/2016
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DRAWING
NUMBER

600-25



INSTALL TRACER WIRE FOR PVC WATER MAIN AND TERMINATE AT CP BOXES AT EACH FIRE HYDRANT. PLACE ONE TO TWO FOOT OF SLACK INSIDE CP BOXES.

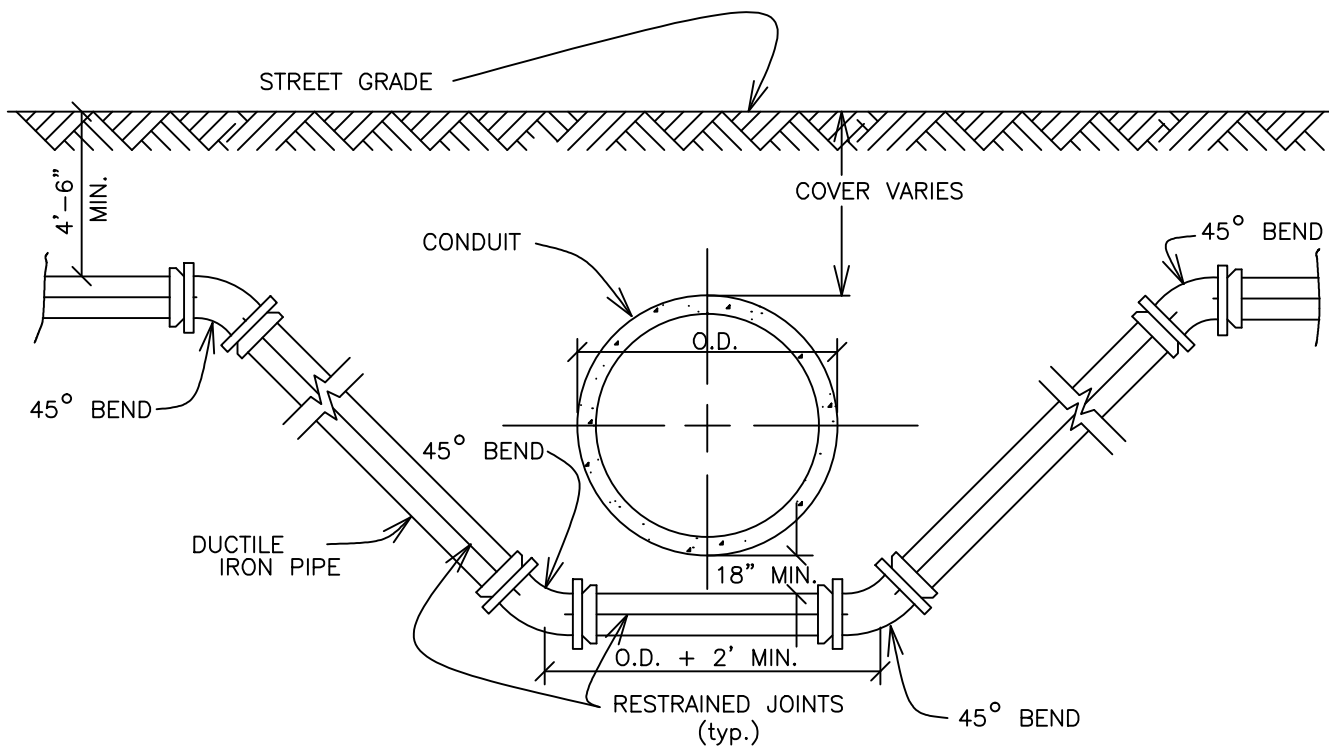


TRACER WIRE
INSTALLATION

DATE 5/1/2016
REVISED BY CWB

DRAWING
NUMBER

600-26



NOTES:

- 1.) LENGTH OF EXTENSION OF PIPE AND RESTRAINED JOINTS SHALL BE IN ACCORDANCE WITH THESE ENGINEERING STANDARDS.
- 2.) ALL WATER MAINS TWELVE (12") INCHES OR SMALLER, SHALL BE DUCTILE IRON.
- 3.) CATHODIC PROTECTION SHALL BE AS REQUIRED IN ACCORDANCE WITH THESE ENGINEERING STANDARDS.
- 4.) A BORED CROSSING MAY BE REQUIRED BY THE ENGINEER.
- 5.) KICKERS SHALL BE REQUIRED AS DIRECTED BY THE ENGINEER.



OPEN CUT CROSSING
BENEATH CONDUIT

DATE 5/1/2016
REVISED BY CWB

DRAWING
NUMBER

600-27